

Accelerator Department  
BROOKHAVEN NATIONAL LABORATORY  
Associated Universities, Inc.  
Upton, New York

AGS DIVISION TECHNICAL NOTE

No. 104

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CS INJECTION INTO A DUOPLASMATRON

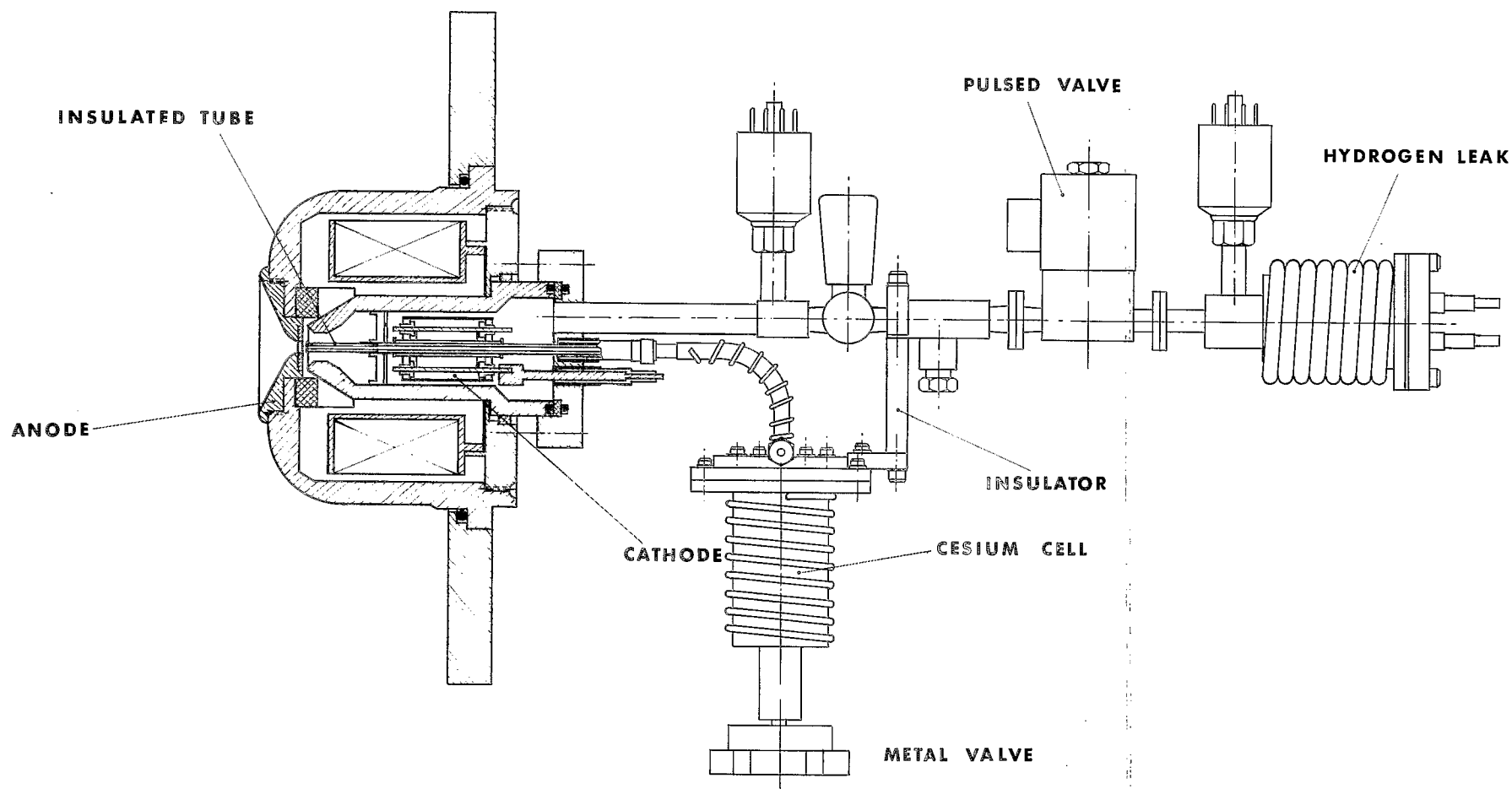
An attempt was made to investigate the effect of cesium injection into the hollow discharge duoplasmatron in analogy with a very successful experiment by Dimov (Novosibirsk) in a cold cathode magnetron source.

On Saturday afternoon, a first attempt was made. The duoplasmatron operated in an hydrogen environment with an  $H^-$  output of one milliampere. We now slowly increased the temperature of the cesium cell and we observed clearly the growth of the  $H^-$  beam, doubling during the first minutes. As an interim test, we closed the valve of the cell and the intensity indeed reduced to half its value. After opening the valve again, voltages across the extractor gap could not be maintained. Probably the temperature in the cell increased enough to coat the cold, high voltage area with some cesium. Several attempts to repeat the above experiment failed.

Though we have hoped to observe a more dramatic effect, the experiment suggests that under proper conditions Cs injection has to be further explored as a possible means to increase negative ion production. This experiment taught us the ground rules for direct Cs injection into any source.

We would like to thank Lou Repeta and his group, as well as the machine shop, for their instant help during this period. Contributions of our Ron Clipperton go beyond any evaluation.

Distr.: AGS Department Physicists  
Department Administration



DUOPLASMATRON WITH CESIUM CELL

NO. REQ.	ACCT. NO.	I.L.R. NO.	ORDER NO.	DEPT.	JOB NUMBER	USED ON DWG. NO.	NO. PER. ASSY.
DEC. ±    ANG. ±    MAX.    MIN. TOLERANCE    BREAK SHARP EDGES					BROOKHAVEN NATIONAL LABORATORY ASSOCIATED UNIVERSITIES, INC. UPTON, N. Y. 11973		
0-20"    20"-60"    OVER 60" FRACTIONAL TOLERANCE    FINISH							
DATE    MATERIAL    SCALE    WEIGHT							
DRAWN BY		CHECKED BY		ENG. APP.	SUPVR. APP.	DRAWING NUMBER	
						-4	
						REV	

REV.	ZONE	DESCRIPTION	BY	DATE	CHK	APP
1						